

Sub
a

- [illegible]

4. The arbitration-throttling control circuit system of claim 1, wherein the buffer controller further comprises:

a byte-clock counter that is clocked based on a frequency of data transfer from the disc, and that produces an output pulse based on the byte-clock counter counting a predetermined number of clock cycles;

an arbitration request counter, operatively coupled to the byte-clock counter, that is incremented by the output pulse of the byte-clock counter, that is decremented when a disc-channel arbitration grant is obtained, and that produces a disc-channel arbitration request if the arbitration request counter has a value of one or more; and

an arbitration logic, operatively coupled to the arbitration request counter, that receives disc-channel arbitration requests and provides disc-channel arbitration grants, in order to spread data bursts from the error-correction buffer to the disc-drive main buffer memory over a period of time substantially equal to the sector transfer time.

5. The arbitration-throttling control circuit of claim 4, wherein the buffer controller further comprises:

a reset circuit configured to reset the byte-clock counter based on a data availability of data out of the error-correction buffer.

6. The arbitration-throttling control circuit of claim 4, wherein each one of the data bursts includes N data bytes, and the arbitration request counter is incremented once for each N byte-clock cycles.

7. The arbitration-throttling control circuit of claim 4, wherein a sector transfer includes (512) data bytes, each one of the data bursts includes sixty-four data bytes, and the arbitration request counter is incremented once for each time period substantially equal to a time needed for sixty-four data bytes to be transferred from the disc.

8. A disc-drive system comprising:
- a disc case;
 - a disc rotatably mounted within the disc case;
 - an actuator assembly mounted within the disc case, the actuator assembly having a transducer head in transducing relationship to the disc;
 - an error-correction buffer operatively coupled to receive data from the transducer head at a disc data rate;
 - a disc-drive main buffer memory operatively coupled to receive data from the error-correction buffer in a plurality of data bursts, each data burst having a burst data rate higher than the disc data rate and each data burst transferring a burst predetermined quantity of data;
 - a system interface;
 - a disc-drive controller operatively coupled to transfer data from the disc-drive main buffer memory to the system interface; and
 - an arbitration-throttling control circuit that arbitrates for access to transfer data into the disc-drive main buffer memory such that data bursts totaling a sector quantity of data from the error-correction buffer to the disc-drive main buffer memory are spread substantially evenly over a period of time substantially equal to a transfer time of the sector quantity of data from the disc into the error-correction buffer, wherein the sector quantity of data is larger than the burst quantity of data.
9. The disc-drive system of claim 8, wherein the arbitration-throttling control circuit, upon an indication that the sector quantity of data from the error-correction buffer is available for transfer, provides one arbitration request to obtain data transfer access to the disc-drive main buffer memory from the error-correction buffer for each time period substantially equal to a time needed for the burst quantity of data to be transferred from the disc.
10. The disc-drive system of claim 8, wherein the sector quantity of data includes (512) data bytes, each one of the data bursts of the burst quantity of data

Sub
al

includes sixty-four data bytes, and the arbitration-throttling control circuit enables up to one additional data burst to occur each time period substantially equal to a time needed for sixty-four data bytes to be transferred from the disc.

11. The disc-drive system of claim 8, wherein the arbitration-throttling control circuit further comprises:

a byte-clock counter that is clocked based on a rate of data transfer from the disc, and that produces an output pulse based on the byte-clock counter counting a predetermined number of clock cycles;

an arbitration request counter, operatively coupled to the byte-clock counter, that is incremented by the output pulse of the byte-clock counter, that is decremented when a disc-channel arbitration grant is obtained, and that produces a disc-channel arbitration request if the arbitration request counter has a value of one or more; and

an arbitration logic, operatively coupled to the arbitration request counter, that receives disc-channel arbitration requests and provides disc-channel arbitration grants, in order to spread data bursts from the error-correction buffer to the disc-drive main buffer memory over a period of time substantially equal to the sector transfer time.

12. The disc-drive system of claim 11, wherein the arbitration-throttling control circuit further comprises:

a reset circuit configured to reset the byte-clock counter based on a data transfer count of data out of the error-correction buffer.

13. The disc-drive system of claim 11, wherein each one of the data bursts includes N data bytes, and the arbitration request counter is incremented once for each N byte-clock cycles.

14. The disc-drive system of claim 11, wherein a sector transfer includes (512) data bytes, each one of the data bursts includes sixty-four data bytes, and the

request counter is incremented once for each time needed for sixty-four data bytes to be transferred to the disc-drive system of claim 1, further comprising a data-handling system operatively coupled to at least one data-handling system further comprising:

- one or more data processors;
- one or more memories operatively coupled to the one or more data processors; and
- at least one input/output system coupled to the one or more data processors to receive input data and to transfer output data;

the method for self-throttling data transfer in an error-correction buffer, the method comprising steps of:

- (a) receiving data into the error-correction buffer at a data rate;
- (b) transferring the data out of the error-correction buffer in data bursts, each one of the data bursts having a burst data rate, the data bursts having a spacing based on the disc data rate.

The method according to claim 16, further comprising:

- (c) performing an error correction operation on the data in the buffer before performing the transferring step.

The method according to claim 16, wherein the error-correction operation is:

- (i) deriving a burst-enable pulse by dividing a predetermined value, wherein the clock signal is based on the predetermined value is based on an amount of data in the error-correction buffer.

15. The disc-drive system of claim 1, further comprising:
a data-handling system operatively coupled to at least read data from the disc, the data-handling system further comprising:
one or more data processors;
one or more memories operatively coupled to each one of the one or more data processors; and
at least one input/output system coupled to at least one of the one or more data processors to receive input data and to supply output data.
16. A method for self-throttling data transfer in an error-correction buffer in a disc drive, the method comprising steps of:
(a) receiving data into the error-correction buffer from a disc transducer at a disc data rate; and
(b) transferring the data out of the error-correction buffer in a plurality of data bursts, each one of the data bursts having a burst data rate that is higher than the disc data rate, the data bursts having a spacing based on a timing signal derived from the disc data rate.
17. The method according to claim 16, further comprising a step of:
(c) performing an error correction operation on the data within the error-correction buffer before performing the transferring step (b).
18. The method according to claim 16, wherein the transferring step (b) further comprises:
(b)(i) deriving a burst-enable pulse by dividing a clock signal by a predetermined value, wherein the clock signal is based on the disc data rate, and the predetermined value is based on an amount of data in one of the plurality of data bursts.

19. The method according to claim 16, wherein the transferring step (b) further comprises:

(b)(ii) upon an indication that the sector quantity of data from the error-correction buffer is available for transfer, providing an arbitration request to obtain data transfer access to the disc-drive main buffer memory from the error-correction buffer for each time period substantially equal to a time needed for a burst quantity of data to be transferred from the disc.

20. A disc drive system comprising:

a base plate;

a rotatable disc mounted to the base plate;

an actuator, the actuator including a transducer mounted to the actuator in transducing relation to the disc;

buffer memory means operatively coupled to the transducer for self-throttling data bursts of an error-correction buffer.